

We claim:

1. A process for the production of flexographic printing plates by means of laser engraving, in which the starting material used is a photopolymerizable flexographic printing element at least comprising, arranged one on top of the other,

- 5 • a dimensionally stable substrate,
- a photopolymerizable, relief-forming layer having a thickness of at least 0.3 mm, at least comprising an elastomeric binder, an ethylenically unsaturated monomer and a photoinitiator, and
- 10 • a protective element substantially transparent to actinic light,

wherein the process comprises - in this sequence - the following steps:

(a) crosslinking of the relief-forming layer in the total volume of the layer by exposure to actinic light through the protective element,

(b) removal of the protective element and

15 (c) engraving of a print relief into the crosslinked relief-forming layer with the aid of a laser emitting from 3 000 to 12 000 nm, the height of the relief elements to be engraved with the laser being at least 0.03 mm,

and the protective element is a film which has been provided with a nontacky treatment or coating on the side facing the relief-forming layer and which is applied directly to the relief-forming layer, the adhesion between the protective element and the relief-forming layer being adjusted so that the protective element can be peeled off the crosslinked, relief-forming layer after process step (a).

2. A process as claimed in claim 1, wherein the protective element comprises a
25 nontacky coating.

3. A process as claimed in claim 2, wherein the nontacky layer substantially comprises a polyamide, and the elastomeric binder in the relief-forming layer is a thermoplastic elastomeric block copolymer of the styrene/butadiene type.

4. A process as claimed in any of claims 1 to 3, which additionally comprises a subsequent cleaning step (d).

5. A process as claimed in any of claims 1 to 4, wherein decomposition products formed in step (c) are sucked away.

6. A process as claimed in any of claims 1 to 5, wherein, after the removal of the protective film (b), the crosslinked relief-forming layer is crosslinked in a subsequent process step (b') to a limited depth of penetration, viewed from the surface, beyond the extent of the crosslinking density produced by step (a).

7. A process as claimed in claim 6, wherein the depth of penetration to which additional crosslinking is effected in step (b') is from 5 to 200 µm.

15 8. A process as claimed in claim 6 or 7, wherein the surface crosslinking step (b') is carried out using UV light having a wavelength of from 200 to 300 nm.

9. A photopolymerizable flexographic printing element, at least comprising, arranged one on top of the other,

20 • a dimensionally stable substrate,

• a photopolymerizable, relief-forming layer having a thickness of at least 0.3 mm, at least comprising an elastomeric binder, an ethylenically unsaturated monomer and a photoinitiator, and

• a protective element substantially transparent to actinic light,

25 wherein the protective element is a film which has been provided with a nontacky treatment or coating on the side facing the relief-forming layer and which is applied directly to the relief-forming layer, the adhesion between the protective element and the relief-forming layer being adjusted so that the protective element can be peeled off the crosslinked relief-forming layer after exposure to actinic light through the protective element.

10. A flexographic printing element as claimed in claim 9, wherein the protective element comprises a nontacky coating.

11. A flexographic printing element as claimed in claim 10, wherein the nontacky layer
5 substantially comprises polyamide.